Special Access Calculation of Channel Mileage Termination Weighted Demand

PRTC - COMBINED

			(C)
	(A)	(B)	Weighted
	Index	Demand	Demand
Telegraph 2 Wire/4 Wire	0.36682	336	123
Voice Grade 2W / 4W	0.36682	19,980	7,329
Program Audio 3.5 khz	0.36682	9,252	3,394
Program Audio 5.0 khz	0.73363	, 0	0
Program Audio 8.0 khz	1.10045	0	0
Program Audio 15 khz	1.46726	0	0
Digital Data 2.4 Kbps	0.36682	0	0
Digital Data 4.8 Kbps	0.36682	24	9
Digital Data 9.6 Kbps	0.36682	984	361
Digital Data 19.2 Kbps	0.36682	264	97
Digital Data 56 Kbps	0.73363	6,888	5,053
Digital Data 64 Kbps	0.73363	0	0
High Capacity 1.54 Mbps	3.08125	6,528	20,114
			36,480

Sources: Col (B) from Volume 4, Section 5

Special Access Calculation of Initial Monthly Voice Grade 2W Channel Termination Rate

PRTC - COMBINED

		Source	Quantity
Line 1.	CT Weighted Demand	Page 16, Tot Col(C)	117,195
Line 2.	CMF Weighted Demand	Page 17, Tot Col(C)	93,200
Line 3.	CMT Weighted Demand	Page 18, Tot Col(C)	36,480
Line 4.	Total Weighted Demand	Ln 1 + Ln 2 + Ln 3	246,875
Line 5.	Total Recurring Special Access Revenue Requirement	Page 15, Line 5	\$6,069,268
Line 6.	Inital VG2W CT Rate	Line 5 / Line 4	\$24.58

Special Access Calculation of Monthly Special Access Rates

	PRTC - COMBINED						
		(A)	(B)	(C)	(D)	(E)	(F)
		CT	CT	CMF	CMF	CMT	CMT
	Service	Rate	Revenue	Rate	Revenue*	Rate	Revenue*
1. 2.	Telegraph 2 Wire	\$24.58	\$13,273	\$3.61	\$4,982	\$9.02	\$3,031
3.	Telegraph 4 Wire	\$49.17	\$590	\$3.61	4 1,002	\$9.02	
4.	Voice Grade 2 Wire	\$24.58	\$175,206	\$3.61	\$354,444	\$9.02	\$180,220
5.	Voice Grade 4 Wire	\$49.17	\$1,481,000	\$3.61	•	\$9.02	·
6.	Program Audio 3.5 khz	\$49.17	\$0	\$3.61	\$224,181	\$9.02	\$83,453
7.	Program Audio 5.0 khz	\$48.36	\$0	\$7.22	\$0	\$18.04	\$0
8.	Program Audio 8.0 khz	\$48.36	\$0	\$10.83	\$0	\$27.05	\$0
9.	Program Audio 15 khz	\$48.36	\$0	\$14.45	\$0	\$36.07	\$0
10.	Digital Data 2.4 Kbps	\$48.12	\$1,155	\$3.61	\$0	\$9.02	\$0
11.	Digital Data 4.8 Kbps	\$48.12	\$577	\$ 3.61	\$0	\$9.02	\$216
12.	Digital Data 9.6 Kbps	\$48.12	\$56,012	\$3.61	\$25,559	\$9.02	\$8,876
13.	Digital Data 19.2 Kbps	\$48.12	\$12,704	\$3.61	\$1,949	\$9.02	\$2,381
14.	Digital Data 56 Kbps	\$48.12	\$415,179	\$7.22	\$484,318	\$18.04	\$124,260
15.	Digital Data 64 Kbps	\$48.12	\$8,084	\$7.22	\$0	\$18.04	\$0
16.	High Capacity 1.54 Mbps	\$107.33	\$717,394	\$26.59	\$1,195,274	\$75.75	\$494,496
17.		-	\$2,881,175		\$2,290,707		\$896,932

Sources:

Col (A) = Page 19, Line 6 * Page 16 Col (A)

Col (B) = Col (A) * Page 16 Col (B)

Col (C) = Page 19, Line 6 * Page 17 Col (A)

Col (D) = Col (C) * Page 17 Col (B)

Col (E) = Page 19, Line 6 * Page 18 Col (A)

Col (F) = Col (E) * Page 18 Col (B)

Special Access Prescribed Channel Termination Telegraph and Voice Grade 2W / 4W Rate Relationship

PRTC - COMBINED

Telegraph	a Proposed CT Rate	b Demand	c=a*b Revenue	d Prescribed Relationship	e=b*d Weighted Relationship	f= tot (c)/tot (e)	(g)=f*d Rate Relationship
Two Wire	\$24.58	540	\$13,273	1.0	540	24.79077	\$24.79
Four Wire	\$49.17	12	\$590	1.6	19.2	24.79077	\$39.67
		_	13863		559.2		
	а	ь	c=a*b	d	e=b*d	f=	(g)=f*d
Voice	Proposed			Prescribed	Weighted	tot (c)/tot (e)	Rate
Grade	CT Rate	Demand	Revenue	Relationship	Relationship		Relationship
Two Wire	\$24.58	7,128	\$175,206	1.0	7,128	29.93865	\$29.94
Four Wire	\$49.17	30,120	\$1,481,000	1.6	48,192	29.93865	\$47.90
		_	\$1,656,206		55,320		

Source:			
Col (a)	Page 20, Col (A)	Col (d)	Prescribed 2W/4W CT Rate Relationship
Col (b)	Page 16, Col (B)		

Special Access Crossover Analysis

PRTC - COMBINED

Voice Grade to Hi Cap DS1

		(A)	(B)
		Voice Grade	Hi-Cap
Config	Element	4 Wire	1.544 Mbps
2	CT	\$98.34	\$214.66
12	CMF	\$43.32	\$319.08
2	CMT	\$18.04	\$151.50
	Total Config	\$159.70	\$685.24

\$638.80

DS1 to VG 4W Crossover (Total Col (B) / Total Col (A))

4.29

Sources:

Col (A) = Config Column * VG4W Rates from Page 20
Col (B) = Config Column * Hi Cap 1.544 Rates from Page 20

Transport Benchmark

		(A)	(B)		
Config	Element	DS1	DS3		
1	CT	\$107.33	\$2,043.34		
10	CMF	\$265.90	\$1,320.70		
2	CMT	\$151.50	\$1,224.32		
1	MUX	n/a	\$563.86		
	Total Config	\$524.73	\$5,152.22		

DS3 to DS1 Crossover (Total Col (B) / Total Col (A))

9.82

Sources:

Col (A) = Config Column * DS1 Rates from Page 20 Col (B) = Config Column * DS3 Rates from Page 10 9.0Z

Worksheet for Development of Weighted DS1/DS3 MOU per Voice Grade Equiv. - Termination and

Weighted DS1/DS3 MOU per Voice Grade Equiv. - Facility

		Source	Amount
A.	Weighted MOUs per Equiv. VG Ter	mination	
1.	Direct Trunk Terminations - DS1	Volume 4	3,564
2.	Direct Trunk Terminations - DS3	Volume 4	60
3.	Total Direct Trunk Terminations	Line 1 + Line 2	3,624
4.	% DS1	Line 1/Line 3	98.34%
5 .	% DS3	Line 2/Line 3	1.66%
6.	MOU Derivations - DS1	24 x 9000	216,000
7.	MOU Derivations - DS3	28 x 24 x 9000	6,048,000
8.	MOUs per Eq. VG Term DS1	Line 4 x Line 6	212,424
9.	MOUs per Eq. VG Term DS3	Line 5 x Line 7	100,132
10.	Total Weighted MOUs per VG Term	Line 8 + Line 9	312,556
ь	Weighted MOUL not Equity VG. Each	ility	
В.	Weighted MOUs per Equiv. VG Fac	•	3,768
1. 2.	Direct Trunk Miles - DS1 Direct Trunk Miles - DS3	Volume 4 Volume 4	240
2. 3.	Total Direct Trunk Terminations	Line 1 + Line 2	4,008
3. 4.	% DS1	Line 1/Line 3	94.01%
5.	% DS3	Line 2/Line 3	5.99%
5. 6.	MOU Derivations - DS1	24 x 9000	216,000
7.	MOU Derivations - DS3	28 x 24 x 9000	6,048,000
7. 8.	MOUs per Eq. VG Miles DS1	Line 4 x Line 6	203,066
9.	MOUs per Eq. VG Miles DS3	Line 5 x Line 7	203,000 362,156
9. 10.	Total Weighted MOUs per VG Term		565,222
10.	rotal vveignted inicos per vo renti	THE O T THE 3	303,222

PRTC DS3 Cost of Service Study

		T-4-1	Т	т	Г
1		Total	}	Monthly	Proposed
		Capitalized	Direct Cost	Revenue Req.	•
					Monthly
		Note 1/	Factor	(Cols. 1 x 2/12)	Rate
1.	Channel Termination	(1)	(2)	(3)	(4)
1 '					
6	a. Outside Plant	6400.00		,,,,,	3.49.41
	Aerial Fiber Optic	\$428.00	XXX		
}	Aerial Installation	\$510.00	xxx	XXX	XXX
ן ב	O. COE	050 000 00			
	Transmission Equip OC-3 2/	\$58,000.00	XXX	· 1	XXX
	Transm. Eq. Install. &Eng.	\$19,800.00	XXX	×××	xxx
c	. Total CT Investment and Rev. Req.	\$78,738.00	0.256	\$1,679.74	\$2,043.34
2.	Channel Mileage Termination (Includes Installation and Engineering) Central Office Facilities				
	Cross Connect	\$14,845.00	XXX	XXX	XXX
	OC-48 Term.	\$9,551.00	XXX	×××	XXX
	Total CMT Investment and Rev. Req.	\$24,396.00	0.256	\$520.45	\$612.16
3.	Channel Mileage Facility				
	Per Mile Facilities Costs				
	Fiber Materials	\$121.00	xxx	xxx	xxx
	Installation & Eng.	\$679.00	XXX	XXX	XXX
			,55		
	Total CMF Investment and Rev. Req. per Mile	\$800.00	0.256	\$17.07	\$132.07

NOTES:

^{1/} Costs pf OC-3 facilities that are used for PRTC's DS-3 circuit provisioning are divided by three to obtain the cost of one DS-3 facility.

3.2 Access Service Order and Access Service Provisioning NRC Study

Non-recurring costs are the one-time, non-capitalized labor costs incurred specifically for the provision of Special Access services that are not sensitive to the volume of services sold. Some of the costs included in this category are service order cost, circuit design, installation activities, central office wiring, and testing.

The Access Service Order and Access Service Provisioning NRC Study is a time and motion study of the non-capitalized work functions associated with processing the service order, and the provisioning and activation of the resulting Special Access service. These functions include verifying the order, establishing the billing process, performing any required negotiations with the access customer, circuit design, installation and testing.

The study process begins by identifying each of the specific work activities involved in providing the services. Next, a sample study of service orders is conducted to identify the average time required to perform each of these functions. Where insufficient data exist for a particular activity, a subject matter expert estimates the time for that particular work function. The next step is to identify the labor costs associated with each of these functions. Labor rates from the Loaded Labor Rate Study (Sec. 3.5) were used for this purpose. The next step is to multiply the appropriate labor rates by the average time for each work function and then "sum" the results. The final step is to convert the per-circuit installation costs to per-channel termination (CT) costs. This is accomplished by first

subtracting the non-recurring service order costs from the total per-circuit non-recurring cost. This result is then divided by the ratio of channel terminations to circuits to develop a cost per channel termination. The summary results of these calculations are displayed in Exhibit 1.

NONRECURRING COSTS SUMMARY

		2W	4W	Low Speed	56 KBPS		
		VG	VG	DDS	DDS	DS1	DS3
1	Billing Rate Codification	\$1.28	\$1.28	\$1.28	\$1.92	\$1.92	\$1.92
2	Entry to Order Control System	\$3.26	\$3.26	\$3.26	\$3.26	\$3.26	\$3.26
2a 3	Entry to Order Control (ICSC) Special Facility (SF) and	\$4.89	\$4.89	\$4.89	\$4.89	\$4.89	\$4.89
	Order Number Assignment	\$3.26	\$3.26	\$3.26	\$3.26	\$3.26	\$3.26
4	Entry to FMS System	\$9.78	\$9.78	\$9.78	\$9.78	\$9.78	\$9.78
5	Assignment of Local Facilities Pairs	\$5.87	\$5.87	\$5.87	\$5.87	\$0.98	\$0.98
6	Circuit Layout (B2)					\$17.95	\$17.95
6a 7	Circuit Layout (B1) Outside Plant Facilities Testing	\$35.90	\$35.90	\$35.90	\$53,85	\$53.85	\$53.85
8	Transmission Facilities Assignment	\$24.00	\$24.00	\$24.00	\$24.00	\$72.00	\$96.00
9	Installation Coordination Installation Coordination (ICSC)	\$22.56	\$22.56	\$22.56 \$62.04	\$22.56 \$62.42	\$22.56	\$22.56
10		\$67.68	\$67.68	\$62.04 \$67.68	\$67.68	\$157.92	\$225.60
11	Field Installation	\$90.24	\$90.24	\$67.68	\$67.68	\$0.00	\$0.00
12	Final Testing	\$19.69	\$22.56	\$45.12	\$45.12	\$45.12	\$270.72
13	Order Completion	\$1.28	\$1.28	\$1.28	\$1.28	\$1.28	\$1.28
14	Entry to Billing, Maintenance Order						
	Control Systems and ICSC	\$4.89	\$4.89	\$4.89	\$4.89	\$4.89	\$4.89
	Automatic Test Entry	\$6.56	\$11.28	\$11.28	\$11.28	\$11.28	\$11.28
	Service Order F/U & Coordination	\$53.09	\$53.09	\$53.09	\$53.09	\$53.09	\$53.09
	Soft Mod/Wiring/Coord	\$0.00	\$0.00	\$6.52	\$0.00	\$0.00	\$0.00
	Manual Partial Test	\$2.63	\$4.51	\$33.84	\$33.84	\$33.84	\$33.84
16a	Service Order Entry Review	\$2.61	\$2.61	\$2.61	\$2.61	\$2.61	\$2.61
	Total Nonrecurring Cost (per circuit)	\$359.45	\$368.92	\$466.81	\$479.26	\$500.47	\$817.75
	Less Service Order Cost	\$79.44	\$79.44	\$79.44	\$80.08	\$80.08	\$80.08
	Total Installation Cost (L17-L18)	\$280.01	\$289.48	\$387.37	\$399.18	\$420.39	\$737.67
	CT/Circuit ratio	1.5414	1.6037	1.6351	1.6323	1.8537	1.5000
21	Installation cost per CT (L19/L20)	\$181.66	\$180.51	\$236.90	\$244.55	\$226.79	\$491.78

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3.7 DS3 Cost of Service Study

The DS3 Cost of Service Study is designed to identify all of the recurring direct² capitalized costs related to provisioning DS3 Access Service. Costs in this study are divided into the following categories and subcategories:

- 1. Customer and Central Office Circuit Equipment These costs are associated with the circuit equipment portion of the Channel Termination tariff rate element. The category includes all the circuit equipment and installation labor used in provisioning DS3 Access Service at the customer's premises and at the telephone company central office. Costs within this category are separated into four types:
 - Common Equipment Includes all common system equipment, including fiber distribution panels, shelves, and other common equipment.

² A direct cost is defined as a cost that is directly traceable to and caused by the production and sale of DS3 Service. It is a cost that can physically be linked to DS3 service without the need of special studies and arbitrary allocations. It can be an allocated cost, but should be allocated on logical cost-causation grounds. Costs not directly attributable to DS3 service)e.g. land, buildings, motor vehicles, corporate overhead) are indirect costs.

- DS3 Interface Equipment Includes DS3 interface equipment, such as DS3 circuit cards, DS3 customer distribution panels, and connections between cards and panels.
- DS1 Interface Equipment Includes DS1 interface equipment, such as DS1 circuit cards, DS1 customer cross-connect panels, and connections between cards and panels.
- Labor Includes all installation labor hours for the above equipment
- 2. Interoffice Circuit Equipment These costs are associated with the Channel Mileage Termination tariff rate element. This category includes the circuit equipment at the telephone company central office used for facilities between wire centers. It includes all the equipment, and installation labor used in provisioning DS3 Access Service at a telephone company central office for interoffice facilities. This study has been completed based on the current network designs for interoffice facilities. Costs within this category are separated into two types:
 - Interoffice Circuit Equipment Includes all circuit equipment at the telephone company central office used for facilities between wire centers.
 - Labor Includes all installation labor hours for the above equipment.
- 3. Cable and Wire Facilities This category is divided into two subcategories:

 Interoffice Cable and Wire, and Subscriber Cable and Wire. The Interoffice Cable and
 Wire subcategory is associated with the Channel Mileage Facility tariff rate element.

Puerto Rico Telephone Company

The Subscriber Cable and Wire subcategory is associated with the cable and wire portion of the channel termination rate element.

Summary results of the DS3 Cost of Service study are shown in Exhibit 6.

Volume 3 Exhibit 5

Puerto Rico Telephone Company Capitalized Loading Study

Summary Results

Loading Class Number Loading Class Description	Loading Class No. 1 COE	Loading Class No. 2 C&WF
1. Materials & Supplies	6.99%	7.25%
2. Transportation	2.53%	1.53%
3. Contract Work	N/A	N/A
4. Protection & Insurance	1.50%	1.50%
5. Taxes	6.60%	6.60%
6. Interest During Construction	N/A	N/A
7. Privileges & Permits	N/A	N/A
8. Engineering	5.32%	9.37%
9. Other	N/A	N/A
10. Total Capitalized Loadings (SUM OF LINES 1 THRU 9)	22.94%	26.25%

3.4 Special Access Relative Index Study (RIS)

The Special Access Relative Index Study (CT-RIS) is used to determine the relative Channel Termination (CT) cost relationships of the various special access services (i.e., telegraph, voice grade, etc.). Two separate studies are required for this purpose. Study A is used to develop circuit equipment costs associated with a CT from the central office location to the Customer Designated Premise (CDP). Study B provides for the development of Cable and Wire Facility (C&WF) equivalencies associated with CTs. The resulting CT equivalency cost relationships are used to disaggregate the CT revenue requirement to the various service types. Equipment prices are from vendor catalogs and/or purchasing records and are capitalized by using the Capitalized Loading Factor Study. Labor rates used in this study come from the Labor Rate Study.

Equipment Costs

Study A utilizes service-specific equipment which is associated with Special Access CTs. In the development of each service-specific equipment cost, a typical (average) loop configuration was selected, and only those types of equipment that are unique (and incremental) to the service were considered. As with the OFF Study, partial utilization of equipment for the service is recognized through the application of fractional quantities to the unit price.

Labor Costs

Labor costs to install and test each service are developed by summing the products of labor hours times labor rates for each component of equipment. The Job Classification Numbers, Labor Hours, and Labor Rates are developed in the Labor Rate Study.

Capitalized Loading Factors

Loading factors, taken from the Capitalized Loading Factor Study, are then applied to the equipment costs. The resulting overhead loadings are then added to the equipment and labor costs to make up the total capitalized equipment cost. Finally, incremental loop costs are developed for each service by identifying the percent occurrence of the equipment used as it is utilized in provisioning a given service. These percent occurrences are developed by studying a representative sample of CTs for each service. By multiplying the equipment costs by the percent occurrence, a weighted cost is calculated for each service. Once the weighted cost is calculated for each service, a relative cost index is

developed. The relative cost index identifies the cost relationship of each special access service relative to VG 2 wire service, which was assigned a base value of 1 (or index). Thus, the relative index value assigned to each service is calculated by dividing the weighted cost for that service by the weighted cost of a VG 2 wire service.

Study B is used to identify the C&WF loop attributes associated with the CT portion of the basic voice grade 4-wire services. Since a 2-wire service typically requires one-half as many "loops" as a 4-wire service, a ratio of 1.0:0.5 has been used to determine the cost relationship of the basic VG 4W/2W service. The results of these studies are presented in Exhibit 3.

INDEX SUMMARY

<u>Service</u>	<u>Total Cost</u>	Index
1. Voice Grade 2-Wire	\$554.66	1.0000
2. Voice Grade 4-Wire	\$740.04	1.3342
3. Program Audio 1	\$601.72	1.0848
4. Program Audio 2,3,4	\$776.70	1.4003
5. Video Services (All)	\$0.00	0.0000
6. Digital Data Services (A	MI) \$677.14	1.2208
7. Hi-Capacity 1.544 Mbps	\$1,866.70	3.3655

Volume 3 Exhibit 3

LOOP EQUIVALENCY STUDY

Worksheet #1 PAGE 1 OF 1

VG 2 WIRE CT CIRCUIT EQUIPMENT

VOICE GRADE 2-WIRE CHANNEL TERMINATIONS

1.	NUMBER OF VG 2 WIRE CTs IN SAMPLE WITH HYBRID OPTION (SEE NOTE) =======>	50
2.	NUMBER OF VG 2 WIRE CTs IN SAMPLE WITH HYBRID OPTION LOCATED AT CUSTOMER'S PREMISE. ====>	50
3.	NUMBER OF VG 2 WIRE CTs IN SAMPLE WITH HYBRID OPTION LOCATED AT CENTRAL OFFICE. ======>	75

Note: From Worksheet #4, Column C, VG 2-Wire Hybrid Option

Volume 3 Exhibit 3

LOOP EQUIVALENCY STUDY

WORKSHEET #2 PAGE 1 OF 1

SERVICE	NUMBER OF CIRCUITS SAMPLED	LOOP EQUIVALENCIES
VOICE GRADE 4-W	50	100
PROGRAM AUDIO 1 3.5 Khz	2	4
PROGRAM AUDIO 2 5.0 Khz	2	4
PROGRAM AUDIO 3 8.0 Khz	2	4
PROGRAM AUDIO 4 15.0 Khz	2	4
DIGITAL DATA 1 2.4 Kbps	0	0
DIGITAL DATA 2 4.8 Kbps	0	0
DIGITAL DATA 3 9.6 Kbps	25	50
DIGITAL DATA 4 56.0 Kbps	25	50
HIGH CAPACITY 1.544 Mbps	50	175

Worksheet #3

	(A)	(B)	(C)= (A)*(B)	(D)	(E) TOTAL
SERVICE	EQUIPMENT TOTAL	TOTAL LOADING	DIRECT OVERHEAD	LABOR COST	CAPITALIZED EQUIPMENT
VG 2 WIRE REPEATER	\$166.59	22.94%	38.22	\$95.08	\$299.90
HYBRID OPTION	\$232.00	22.94%	53.23	\$96.92	\$382.15
UNIQUE DISTANCE SENSITIVE EQUIP	\$0.00	22.94%	0.00	\$0.00	\$0.00
VG 4 WIRE REPEATER	\$194.69	22.94%	44.67	\$120.37	\$359.73
LEVEL ADJUSTMEN	\$232.00	22.94%	53.23	\$95.08	\$380.31
UNIQUE DISTANCE SENSITIVE EQUIP	\$0.00	22.94%	0.00	\$0.00	\$0.00
PROGRAM AUDIO 1 REPEATER	\$410.59	22.94%	94.21	\$96.92	\$601.72
UNIQUE DISTANCE SENSITIVE EQUIP	\$0.00	22.94%	0.00	\$0.00	\$0.00
PROGRAM AUDIO 2-4 COMMON EQUIP. P	\$488.59	22.94%	112.10	\$176.00	\$77 6.70
UNIQUE DISTANCE SENSITIVE EQUIP	\$0.00	22.94%	0.00	\$0.00	\$0.00
VIDEO SERVICES (ALL UNIQUE EQUIP. PK	-) \$511.64	22.94%	117.39	\$294.71	\$923.74
UNIQUE DISTANCE SENSITIVE EQUIP	\$379.00	22.94%	86.96	\$250.83	\$716.79
DIGITAL DATA (ALL) OFFICE CHANNEL	\$406.12	22.94%	93.18	\$177.84	\$677.14
UNIQUE DISTANCE SENSITIVE EQUIP	\$0.00	22.94%	0.00	\$177.84	\$177.84
HI-CAP 1.544 Mbps REPEATER	\$644.72	22.94%	147.92	\$333.26	\$1,125.91
UNIQUE DISTANCE SENSITIVE EQUIP	\$379.00	22.94%	86.96	\$274.83	\$740.79